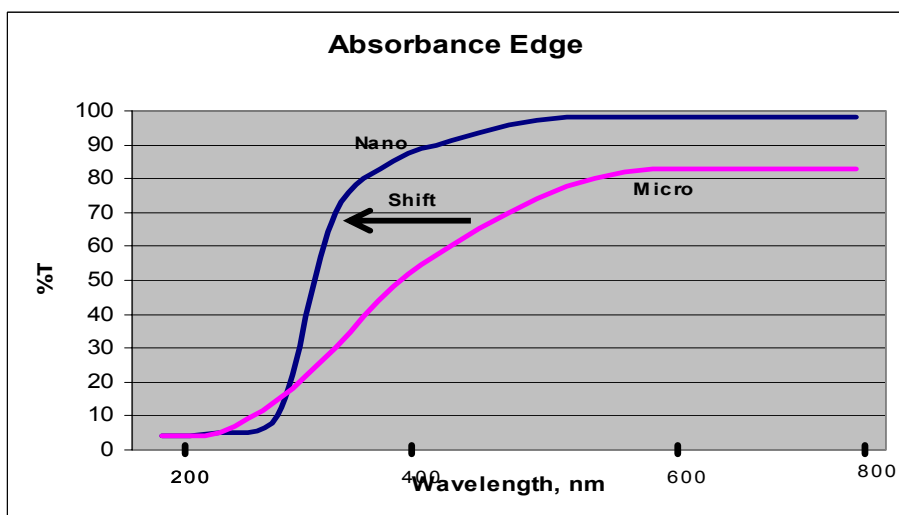


## How do nano metal oxides function as UV absorbers in clear coatings?

Conventionally, the coating industry has been using organic UV absorbers for protecting the organic coating from photochemical degradation caused by sunlight. However, these suffer from the diminishing of their activity over the service life and are prone to migration in the film.

With the advent of nanotechnology, new UV absorbers based on nanosize zinc oxide, cerium oxide and titanium dioxide have arrived on the market in dispersion form.

These oxides in the conventional particle sizes could not be used in the clear coats due to lack of transparency to visible light and the mattening effect. However at nanosizes of 20~60 nm these become transparent to visible light due to widening of the band gap and resultant blue shift (Figure). Their absorption edge lies between 350~370 nm. This provides good transparency in the visible range and absorption in the UV-C and UV-B range.



The other characteristic of these nanosize oxides is the high efficiency of UV blocking even at very low dosage of 1~2 % owing to higher surface area for interaction with light. Being inorganic solids, they are non-migratory and retain their absorptivity over long durations.